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XI.

LIST OF THE MARINE ALGÆ OF THE UNITED STATES,

WITH NOTES OF NEW AND IMPERFECTLY KNOWN SPECIES.

BY W. G. FARLOW.

Presented, March 9, 1875.

SINCE the publication, in 1857, of the third part of the Nereis Am.-Bor., by Prof. W. H. Harvey, the contributions to our knowledge of North American algæ have not been numerous. Prof. J. G. Agardh, of Lund, and Dr. F. J. Ruprecht, of St. Petersburg, are almost the only persons who have described new species found on our shores. That so few novelties have been described by American botanists, is to be attributed to the fact that the eastern coast, where the greater number of our botanists reside, has a very limited flora. From Eastport, Me., to Boston, the flora is arctic in character; and, as usual in such cases, the number of species is small in comparison with the number of individuals. Of the habits of the winter and spring species of this portion of the coast we know very little, since the severity of the climate renders frequent visits to the shore at those seasons difficult, if not dangerous. The marine vegetation from Nantucket to New York has been better studied than that of any other portion of our coast. By the opportunities for dredging offered by the United States Fish Commission, under Prof. Baird, it has been found that some of the plants, as *Euthora cristata*, Ag., which were supposed to be peculiar to northern New England, occur in the deeper and cooler water south of Cape Cod. Although some localities, as Wood's Hole, are comparatively rich in species, it must be confessed that north of Key West there are no places to be compared, as far as the richness of the marine flora is concerned, with the coast of Devonshire in England, or that of France from Calvados to Finisterre. On the coast from New York northward we are not to expect many additions, except of the smaller species of *Ectocarpus*, *Lyngbya*, &c. The reprehensible practice of our algologists, of collecting and drying large numbers of specimens, rather than of making careful microscopic investigations on the shore, is not conducive to a scientific knowledge of our algæ. Of the coast from New York to Charleston we know very little; but, owing to its sandy character, we are not to expect much. Botanists visiting the Delaware Breakwater, Norfolk, or Wilmington, N.C., would do good service by giving lists of the algæ found there, that the southern limit of several common species might be fixed.

Whatever may be said of the poverty of our eastern coast, Key West outranks even the famous Biarritz for number of species. It is curious to notice the very large per cent of the species in the following list which occur there. The flora of that region is peculiarly West Indian, and has little in common with that of the rest of the United States. We are in almost complete ignorance of the algæ on the coast of the States bordering on the Gulf of Mexico. The Pacific coast far exceeds the eastern in the richness of its flora, and future additions to our algæ will come from this region. Fortunately, the number of botanists in the Pacific States is now tolerably large, and the work of deciding the limits of doubtful species must be accomplished by observers on that shore rather than in eastern herbaria.

The classification followed in the accompanying list is that adopted by Harvey in the Nereis Am.-Bor. Since his day, discoveries have been made with regard to the development of the different groups, which demand a complete revision of Harvey's classification; but this is not the place for instituting such a change. Species not mentioned in the Nereis are denoted by a star. The attention of persons living on the seashore is directed to the italicized questions.

The list is intended to include all the species growing on the shores of the United States *proper*, not including Alaska. Those of Vancouver's Island are only in part enumerated, and some of the following named species mentioned by Harvey, in his article on the Algæ from the North-west Coast, may occur also in our Pacific States: *Cystophyllum Lepidium*, Rupr.; *Carpomitra Cabreræ*, Kütz.; *Agarum fimbriatum*, Harv.; *Laminaria apoda*, Harv.; *Ectocarpus oviger*, Harv.; *Polysiphonia senticulosa*, Harv.; *Cystoclonium gracilarioides*, Harv.; *Callophyllis flabellulata*, Harv.; *Kallymenia reniformis*, Ag.; *Iridæa cordata*, Ag.; *Halymenia ligulata*, Ag.; *Prionitis Lyallii*, Harv.; *Schizymenia? coccinea*, Harv.; *Callithamnion thuyoideum*, Ag.; and *C. subulatum*, Harv.

MELANOSPERMÆ.

FUCACEÆ.

1. Sargassum vulgare, Ag. Wood's Hole, Mass., and southward. — Under this species must be included *S. Montagnei*, Bailey, which is certainly nothing more than a variety.

2. Sargassum affine, Ag. Florida? — *S. platycarpum*, Mont., recognized by the large size of the glands on the leaves, was incorrectly distributed by me as *S. affine* with C. Wright's Cuban Algæ.

3. Sargassum bacciferum, Ag. Gulf Stream, coast of Florida.

4. Sargassum hystrix, Ag. — This species, according to Agardh, ranges from Mexico to Newfoundland. I have specimens from Cuba, collected by *Mr. Charles Wright;* but it must be regarded as extremely doubtful if the species occurs on the New England coast, particularly north of Cape Cod.

5. Sargassum filipendula, Ag. Key West, fide *Prof. D. C. Eaton.*

*6. Sargassum dentifolium, Ag. Key West, *Dr. E. Palmer.* — It is not stated whether this plant was floating or attached. The specimens collected by Dr. Palmer are more luxuriant than those from the Red Sea, but the serrated midrib seems sufficiently characteristic to warrant us in supposing that the species is the same. In a genus containing so many variable species as *Sargassum*, it hardly seems as though the length of the fructifying ramuli and the size of the air-bladders could constitute specific differences.

7. Turbinaria vulgaris, Ag. Key West.

8. Phyllospora Menziesii, Ag. San Diego, Cal., and northward. — Some forms received from San Diego are quite smooth, and the leaflets are serrated, so that this species approaches nearer to *P. comosa* of Australia than has generally been supposed. The smooth lower leaflets easily fall off, and make excellent specimens of *Laminaria.* Most of the specimens of *Laminaria* from Southern California are of this nature. — *How and when does this plant fruit?*

Halidrys siliquosa, Lyngb. — Said to have been found at Newfoundland. As yet no collector, so far as I know, has seen it on the New England coast.

9. Halidrys osmundacea, Harv. San Diego, Cal., and northward. — Extremely variable. It was stated by Ruprecht, and is now generally admitted, that the *Cystoseira expansa* of Agardh is nothing but the tips of this plant. The fruit, in one specimen sent by *Mr.*

Cleveland from San Diego, entirely covers one of the lower leaves, something like the normal state in *Landsburgia quercifolia.*

Cystoseira myrica, Ag. Nassau, *Dr. E. Palmer.* — Will probably be found at Key West.

10. FUCUS (FUCODIUM) FASTIGIATUS, Ag. Pacific coast.

11. FUCUS (OZOTHALLIA, Thuret) NODOSUS, L. East coast. — *Southern limit?*

12. FUCUS DISTICHUS, L. (*F. filiformis*, Gm.) Marblehead, Mass. — Common in the fall. No other locality on our coast yet known, although, probably, not rare.

13. FUCUS FURCATUS, Ag. — Common on the Maine and Massachusetts coast, growing in deeper water than *F. vesiculosus.* This species has the antheridia and spores in the same conceptacles, as is the case with *F. platycarpus*, Thuret, a species not as yet recognized on our coast, although it will probably be found. California, fide *Lenormand.*

14. FUCUS CERANOIDES, L. East coast.

15. FUCUS HARVEYANUS, Dcne. Monterey, Cal.

16. FUCUS VESICULOSUS, L. East and west coasts; North Carolina, *Rev. E. M. Forbes.* — *Southern limit?*

17. FUCUS SERRATUS, L. Newburyport, Mass.; Pictou, N.S. Only two stations in America.

18. HIMANTHALIA LOREA, Lyngb. " Coast of N. America," Ag.

SPOROCHNACEÆ.

This and the remaining orders classed by Harvey in the Melanospermæ are, with the exception of the *Dictyotaceæ*, placed by Thuret in his division *Phæosporæ* (vid. Ann. des Sciences Nat. 3 série, t. 14, 1850).

19. ARTHROCLADIA VILLOSA, Duby. Wilmington, N.C.

20. DESMARESTIA ACULEATA, Lmx. New York northward. — *West coast? Fruit?*

21. DESMARESTIA VIRIDIS, Lmx. New York and northward. — *West coast?*

22. DESMARESTIA LIGULATA, Lmx. Monterey northward.

LAMINARIACEÆ.

23. MACROCYSTIS PYRIFERA, Ag. West coast.

24. NEREOCYSTIS LÜTKEANA, Post. and Rupr. Monterey northward. — *Fruit?*

Lessonia. — Species of this genus certainly exist on the Pacific coast, but of their specific characters we are still as ignorant as in the time of Harvey. Specimens which find their way to the east are too imperfect for determination. Some of the supposed specimens of *Lessonia* are nothing but the bladderless leaves of *Macrocystis.* Others are the young fronds of *Phyllospora.* I have specimens from Oregon, collected by *Mr. E. Hall*, which may belong to *L. fuscescens*, but they are too imperfect to warrant giving a decided opinion.

*25. PTERYGOPHORA CALIFORNICA, Ruprecht. "Pflanzen aus dem nördl. Theile des Stell. Oceans," p. 17, Plate V. Santa Cruz, Cal., and northward. — *May not this prove to be a* Lessonia? *Fruit?*

*26. POSTELSIA PALMÆFORMIS, Ruprecht, l. c. p. 19, Plate VI. Santa Cruz, Cal., northward. — *Fruit?*

27. ALARIA ESCULENTA, Grev. (inc. *A. Pylaii*, Grev.) Cape Cod northward; north-west coast.

28. ALARIA FISTULOSA, Post. and Rupr. North-west coast.

29. ALARIA MARGINATA, Post. and Rupr. North-west coast.

30. COSTARIA TURNERI, Grev. (inc. *C. Mertensii*, Ag.) North-west coast.

31. DICTYONEURON CALIFORNICUM, Ruprecht, l. c. p. 24, Plate VII. — I have never seen specimens of this plant, but from Ruprecht's figure one might infer that it is a species of *Costaria.* North-west coast.

32. LAMINARIA FASCIA, Ag. New York northward. — This belongs to the genus *Phyllitis*, of Le Jolis's "Liste des Algues marines de Cherbourg."

33. LAMINARIA DERMATODEA, De la Pyl. Peak's Island, Portland harbor, Me., common just below low-water mark, *W. G. F.*; Eastport, Me., *Prof. D. C. Eaton.* — Recognized by the very short root fibres and flat stipe, gradually expanding into a thick coriaceous frond of lanceolate outline; often, when exposed, splitting to the base of the stipe. *Time and mode of fruiting?*

34. LAMINARIA SACCARHINA, Lmx. New York northward. — *Southern limit? West coast?*

35. LAMINARIA LONGICRURIS, De la Pyl. Common from Boston northward. Old Lyme, Conn., *Prof. D. C. Eaton.* — Not always readily distinguished from the last. The hollow stipe is not always diagnostic, since it is only when the plant has attained a certain age that the stipe is hollow. On the other hand, old stipes of *L. saccarhina* are sometimes hollow for a short distance. The stipe of this plant is infested by a species of *Sphæria.* The *Laminaria trilaminata,*

Olney, is a monstrous form of *L. saccarhina*, with abnormal development of the midrib. I have seen a similar monstrosity in *Agarum Turneri.*

36. Laminaria digitata, Lam. of Harvey's Nereis Am.-Bor. — Under this head are included two, and possibly three, different species of our coast. One seems to be the *L. flexicaulis*, Le Jolis, of Europe. It is possible that some of the plants belong to *L. Cloustoni*, Edm. *What is the southern limit of the digitate species on our eastern coast?*

37. Agarum Turneri, Post. and Rupr. Nahant, Mass., and northward; north-west coast. — *What is the fruit of this plant?* The plate No. V. of the Ner. Am.-Bor. represents this plant as having tetraspores. If such is the case, which is very doubtful, the plant is far removed from *Laminaria*, the fructification of which has been thoroughly studied by Thuret.

Agarum pertusum, Mert., and *A. Gmelini*, judging from the plates in Postels and Ruprecht, are varieties of *A. Turneri.*

38. Thalassiophyllum Clathrus, Post. and Rupr. North-west coast. — *Fruit?*

39. Chorda filum, Stack. New York northward.

40. Chorda (Scytosiphon) lomentarius, Lyngb. Whole eastern coast. — *California?*

DICTYOTACEÆ.

Haliseris. — I have no specimens from the United States, but no doubt some of the West Indian species, as *H. Justii*, *plagiogramma*, *delicatula*, &c., occur on our coast.

41. Padina pavonia, Lmx. North Carolina, fide *Rev. M. A. Curtis;* and southward. — *Northern limit?*

P. Durvillæi, Bory. — Possibly only a form of the last. May be expected in Southern California, as it occurs in Magdalena Bay, where it was collected by the Hassler Expedition.

42. Zonaria flava, Ag. San Diego, Cal., *Mr. D. Cleveland.*

*43. Zonaria interrupta, Ag. California, Australia, *C. B. S.*

44. Zonaria lobata, Ag. Key West.

45. Taonia? Schrœderi, Ag. Florida, *Dr. E. Palmer.*

46. Dictyota fasciola, Lam. Florida.

47. Dictyota dichotoma, Lam. Charleston, S.C., and southward.

48. Dictyota ciliata, Ag. Key West.

Dictyota crenulata, Ag. Was collected in Cuba by *Mr. C. Wright.* It probably will be found at Key West.

Dictyota Brongniartii, Ag. Nassau, *Dr. E. Palmer.*

49. Stilophora rhizodes, Ag. Long Island Sound; Wood's Hole, Mass.

50. Stilophora papillosa, Ag. Chesapeake Bay.

51. Dictyosiphon fœniculaceus, Grev. L. I. Sound northward.

52. Striaria attenuata, Grev. Flushing, L. I.

53. Punctaria latifolia, Grev. New York northward.

Var. *Zosteræ*, Le Jolis. (*P. tenuissima*, Harv. Ner.) Same limits.

54. Punctaria plantaginea, Grev. Orient Pt., L.I., *W. G. F.;* Boston, *Mr. G. B. Emerson.*

*55. Asperococcus compressus, Griff. Gloucester, Mass. Collected by *Mrs. J. T. Lusk.* Europe.

56. Asperococcus sinuosus, Bory. Key West; San Diego, Cal., *Hassler Exp.*

57. Asperococcus echinatus, Grev. Fisher's Island, N. Y., *W. G. F.;* Boston, *Mr. G. B. Emerson.*

58. Hydroclathrus cancellatus, Bory. Florida.

CHORDARIACEÆ.

59. Chordaria flagelliformis, Ag. New York northward.

*60. Chordaria abietina, Rupr. mscr. Not hitherto published. — Fronds gregarious or solitary, 3–6 inches long; root scutate; main axis slightly compressed, and surrounded on all sides by radiating ramuli, 1–2 inches long, tapering at both ends, narrowly linear in outline, solid when young, tubular when old. Related to *C. flagelliformis*, but easily distinguished by the greater width and compression of the axis, and shortness of the ramuli, which are of nearly uniform length, by the substance, which is much softer than in *C. flagelliformis*, and the lighter color. It adheres to paper. Oregon, *Mr. E. Hall;* California.

61. Chordaria divaricata, Ag. New York to Cape Cod; Cape Ann, Mass.

Mesogloia. — Three species are mentioned by Harvey as occurring on our east coast. Of these, —

62 & 63. Mesogloia vermicularis, Ag., is a true *Mesogloia*, and is occasionally found on Cape Ann, Mass. *M. virescens* and *M. Zosteræ*, of the Nereis, belong to the genus *Castagnea*, Derb. and Sol., and their occurrence on our northern shores needs confirmation. M. virescens occurs at Key West. The species of this genus, as well as of the *Ectocarpaceæ*, can be well determined only when fresh or in alcohol, or some of the ordinary preservative fluids. Sterile specimens are almost worthless.

64. LIEBMANNIA LEVEILLEI, Ag. West coast. — This is to be expected at Key West.

65. LEATHESIA TUBERIFORMIS, Gray. New York northward.

*66. RALFSIA VERRUCOSA, Aresch. Portland harbor, Me.; Marblehead and Nahant, Mass., *W. G. F.* Not mentioned by Harvey, but probably common on the New England coast. Europe.

67. ELACHISTA FUCICOLA, Fr. New England coast. Common.

68. MYRIONEMA STRANGULANS, Grev. On Ulva. Fisher's Island, N.Y., *W. G. F.*

ECTOCARPACEÆ.

69. CLADOSTEPHUS VERTICILLATUS, Ag. New England coast.

70. CLADOSTEPHUS SPONGIOSUS, Ag. With the last.

71. SPHACELARIA CIRRHOSA, Ag. New York northward.

72. SPHACELARIA RADICANS, Dillw. Peak's Island, Portland, Me.; Nahant, Mass.; Noank, Conn., *W. G. F.*

73. MYRIOTRICHIA FILIFORMIS, Harv. Penobscot Bay; Rhode Island, *Mr. S. T. Olney.*

Ectocarpus. — Specimens of this genus are worthless unless in fruit. They should be kept in fluid. Of the two kinds of fruit, *trichosporangia*, or multilocular sporangia, and *oösporangia*, or unilocular sporangia, only the former have been observed in this country, unless *E. oviger*, Harv., from California, be the oösporangial state of some species, as one might infer from Harvey's drawing in the Herbarium of Trinity College, Dublin.

74. ECTOCARPUS BRACHIATUS, Harv. Boston northward.

75. ECTOCARPUS FIRMUS, Ag. (*E. littoralis*, Harv. in Nereis Am.-Bor.) New England coast.

76. ECTOCARPUS LONGIFRUCTUS, Harv. Penobscot Bay.

77. ECTOCARPUS SILICULOSUS, Lyngb. Charleston, S.C., northward.

78. ECTOCARPUS AMPHIBIUS, Harv. New York.

79. ECTOCARPUS VIRIDIS, Harv. Charleston, S.C., and northward.

80. ECTOCARPUS LUTOSUS, Harv. Greenport, L.I.

81. ECTOCARPUS TOMENTOSUS, Lyngb. Boston northward. — Some forms of *E. siliculosus* resemble this.

82. ECTOCARPUS FASCICULATUS, Harv. Rhode Island.

83. ECTOCARPUS GRANULOSUS, Ag. Boston.

84. ECTOCARPUS MITCHELLÆ, Harv. Nantucket.

85. ECTOCARPUS DURKEEI, Harv. Portsmouth, N.H.

86. ECTOCARPUS LANDSBURGII, Harv. (?) Halifax, N.S.

87. Ectocarpus Hooperi, Harv. (?) Greenport, L.I.

88. Ectocarpus Dietziæ, Harv (?) Greenport, L.I.

The last four species seem to have been founded by Harvey on single or infertile specimens, a mode of proceeding against which he carefully warned others. An examination of the authentic specimens in the Herbarium of Trinity College, Dublin, convinced me that it would be next to impossible to recognize the two last-named species. Specimens distributed by American collectors under any of the names in question should be regarded with great suspicion.

RHODOSPERMÆ.

The older name *Florideæ* of Agardh should be restored to this very natural group, which, since the discovery by MM. Thuret and Bornet of their mode of fertilization (vid. Ann. des Sciences Nat. 5 série, t. 7), must be considered the most highly organized of the algæ.

RHODOMELACEÆ.

89. Amansia multifida, Lmx. Key West.

Odonthalia dentata, Lyngb. Halifax, N.S. — Probably occurs on the coast of Maine.

*90. Odonthalia aleutica, Ag. Oregon.

*91. Odonthalia Lyallii, Harv. Vancouver's Island.

92. Alsidium Blodgettii, Harv. North Carolina, *Mr. Forbes;* and southward.

93. Alsidium (Bryothamnion, Ag. Spec.) triangulare, Ag. Key West.

*94. Bryothamnion Seaforthii, Ag. Florida, *Dr. E. Palmer;* West Indies.

95. Acanthophora Thierii, Lmx. Florida.

96. Acanthophora Delilei, Lmx. Florida.

*97. Acanthophora muscoides, Ag. Florida, *Dr. E. Palmer.*

98. Chondria (Chondriopsis, Ag. Spec. Alg.) dasyphylla, Ag. Cape Cod southward.

99. Chondria striolata, Ag. (inc. *C. Baileyana*, Mont.) Cape Cod southward.

100. Chondria tenuissima, Ag. Long Island Sound; Boston?

101. Chondria littoralis, Harv. Wood's Hole, Mass., *W. G. F.;* Florida.

102. Chondria atropurpurea, Harv. Charleston, S.C., southward; California!

103. Chondria nidifica, Harv. Pacific coast.

104. Rhodomela Larix, Ag. Oregon, *M. E. Hall.*

105. Rhodomela floccosa, Ag. (inc. *R. pilulifera*, Grev.) Oregon.

106. Rhodomela subfusca, Ag. New York northward.

Var. gracilis (*R. gracilis*, Ner. Am.-Bor.) more common north of Cape Cod.

Var. Rochei (*R. Rochei*, Ner. Am.-Bor.), spring, more common in Long Island Sound.

107. Digenia simplex, Ag. Key West.

108. Polysiphonia urceolata, Grev. New York northward; California.

Var. formosa. Same limits.

109. Polysiphonia Havanensis, Mont. Agardh includes under this species *P. Binneyi*, Harv. Florida.

110. Polysiphonia ferulacea, Ag. (inc. *P. breviarticulata*, Harv.) Key West.

111. Polysiphonia subtilissima, Mont. Jackson's Ferry, West Point, N.Y.; Providence, R. I.; Newburyport, Mass.

112. Polysiphonia secunda, Ag. Key West.

113. Polysiphonia fracta, Harv. Key West.

114. Polysiphonia echinata, Harv. Key West.

115. Polysiphonia hapalacantha, Harv. Key West.

116. Polysiphonia Gorgoniæ, Harv. Key West.

117. Polysiphonia Olneyi, Harv. New York northward.

118. Polysiphonia Harveyi, Bail. New York northward.

Var. arietina. Nahant, Mass., *W. G. F.* — *Northern limit?* It is probable that Nos. 117 and 118 should be united with *P. spinulosa*, Grev., found in the north of Scotland, and on the shores of the Adriatic and Mediterranean. The only opportunity I have had for examining the last-named plant living was at Antibes, France. There can have been no mistake in the species, as it was determined by M. Thuret, the highest authority. I must confess that I could see no difference between *P. spinulosa* and our own *P. Harveyi.* It is to be regretted that *P. spinulosa* is not more common, so as to afford more ample means for comparison. As to the two forms, *P. Olneyi* and *P. Harveyi*, I feel obliged to regard them as varieties of one species, since, although I have had excellent chances for observing both forms growing, I have found so many intermediate states that I am quite unable to draw the line. My friend, Prof. D. C. Eaton, with excellent opportunities for observing both forms, has had a similar experience.

Furthermore, the variety *arietina*, considered by Bailey a good species, differs more from the typical form of *P. Harveyi* than does *P. Olneyi;* and, if we are to regard *P. Olneyi* as a species, we must also separate *P. arietina*, as well as several other varieties, — a division by all means to be avoided. The description of *P. subcontorta*, Peck, answers perfectly to *P. Harveyi.*

119. POLYSIPHONIA HIRTA, Ag. (*P. ramentacea*, Harv.) Key West.

120. POLYSIPHONIA ELONGATA, Grev. Lynn, Mass.; Vineyard and Long Island Sounds. Common.

121. POLYSIPHONIA VIOLACEA, Grev. New York northward.

122. POLYSIPHONIA FIBRILLOSA, Grev. Noank, Conn.; Orient Point, L.I.

*123. POLYSIPHONIA PENNATA, Ag. on *Gelidium cartilagineum.* San Diego, Cal., *Mr. D. Cleveland;* Southern Europe.

124. POLYSIPHONIA PARASITICA, Grev. Rhode Island.

*125. POLYSIPHONIA DENDROIDEA, Mont. Considered by Agardh a variety of the above, is common in California. Originally from Peru and west coast of South America. The Californian specimens are very luxuriant, and I had formerly erroneously supposed them to be the *Rytiphlœa ? Baileyi* of Harvey.

126. POLYSIPHONIA BAILEYI, Ag. (*Rytiphlœa ?* Harv.) Pacific coast. To the naked eye not very unlike some states of *Rhodomela floccosa.*

127. POLYSIPHONIA PECTEN VENERIS, Harv. Florida.

128. POLYSIPHONIA EXILIS, Harv. Key West.

129. POLYSIPHONIA ATRORUBESCENS, Grev. New York to Cape Cod.

130. POLYSIPHONIA BIPINNATA, Post. and Rupr. West coast. — Under this name, Agardh, in his Spec. Alg. p. 1040, includes *P. Californica*, Harv., and *Polyostea gemmifera*, Rupr. Alg. Ochot. Harvey was not of the opinion that *P. Californica* and *P. gemmifera* should be united, inasmuch as he distributed specimens of both species in the algæ of the North Pacific Expl. Exp. under Capt. John Rodgers. Under *P. Californica*, Harvey includes, however, two sets of specimens, — those originally from California, to which he gave the manuscript name of *P. plumigera*, and those collected by the Rodgers Expedition. The former are much coarser than the latter, and do not adhere well to paper. A cross-section of the larger branches shows distinctly fourteen peripheral cells, agreeing with the figure of *P. gemmifera*, Rupr. Alg. Ochot. Plate 11, ag. The specimens collected by Mr. E. Hall in Oregon,

which I formerly distributed under the name of *P. Californica*, agree perfectly with the type specimens of Harvey in aspect, and also show fourteen peripheral cells in a cross-section. The specimens of the Rodgers Expedition adhere well to paper, and bear some external resemblance to certain forms of *P. urceolata*. A cross-section of the stem shows eleven and twelve peripheral cells, and agrees well with a specimen from California presented to me by Prof. Eaton, where a cross-section of the lower part of the frond shows eleven cells. Both the latter show on lateral view six or seven cells; and, as is also the case with Harvey's type specimens, they are often spirally twisted, as in *P. atrorubescens*. The length of the articulations — a specific character, as it seems to me, of very little value in Polysiphonia — is variable. The shape and position of the conceptacles in the specimen given me by Prof. Eaton are very much the same as in the figure of *P. gemmifera* above quoted. Harvey's specimens of *P. gemmifera*, as far as I can see, do not differ from those of *P. Californica* of the Rodgers Expedition, except in being shorter, and in the fact that the ultimate divisions of the frond are incurved. I think almost any one would agree with Agardh in thinking that the *P. gemmifera* of Ruprecht is not specifically distinct from his *P. bipinnata*, which is the older of the two and must take precedence. Under *P. bipinnata* are therefore clearly included the Rodgers Exp. specimens of *P. Californica* and *P. gemmifera*, and the specimen of Prof. Eaton. As to the type specimens of *P. Californica* and Hall's Oregon specimens, although coarser, and differing in aspect from the others, I can find no definite character by which to separate them, since the number of peripheric cells is hardly ever constant when they exceed ten. In this case, Harvey says they are about ten in number, and Agardh twelve, whereas I certainly found fourteen in a specimen of Harvey's. The plan of ramification is the same in each. At any rate, they do not differ from one another more than the forms correctly included under *P. violacea* of the east coast. Without a long experience on the Pacific coast, it seems to me unsafe to consider that *P. Californica* is any thing more than a variety of *P. bipinnata*, Rupr. I might here remark that the difference in aspect between an alga mounted in fresh and one of the same species mounted in sea water is very great; *e.g.*, *P. violacea*. With regard to the specimens in question, I have no means of knowing how they were prepared.

131. Polysiphonia Woodii, Harv. West coast. — Very distinct. Compressed, showing usually 18–20 peripheral cells in cross-sections, decidedly more than in *P. bipinnata*. On a lateral view, the cells are not parallel, but converge towards the base, somewhat as in *P. para-*

sitica, from which it is easily distinguished by its ramification, which is more like a *Microcladia*.

132. POLYSIPHONIA NIGRESCENS, Grev. East and west coasts.

133. POLYSIPHONIA VERTICILLATA, Harv. California.

134. POLYSIPHONIA FASTIGIATA, Grev. New York northward.

135. BOSTRYCHIA MONTAGNEI, Harv. Key West.

136. BOSTRYCHIA CALAMISTRATA, Mont. Key West.

137. BOSTRYCHIA RIVULARIS, Harv. Isle of Shoals, N.H., to Florida.

138. BOSTRYCHIA TUOMEYI, Harv. Florida.

*139. BOSTRYCHIA MORITZIANA, Mont. Florida, *Dr. E. Palmer;* Guiana and West Indies.

140. DASYA GIBBESII, Harv. Key West.

141. DASYA ELEGANS, Ag. Key West.

142. DASYA RAMOSISSIMA, Harv. Key West.

143. DASYA HARVEYI, Ashmead. Key West.

144. DASYA MOLLIS, Harv. Key West.

145. DASYA MUCRONATA, Harv. Key West.

146. DASYA WURDEMANNI, Bailey. Key West.

*147. DASYA CALLITHAMNION, Harv. San Diego, Cal., *Mr. D. Cleveland.* — Differs from *D. Wurdemanni*, in showing on cross-sections only four cells surrounding a central cell.

148. DASYA TUMANOWICZI, Gatty. Key West.

149. DASYA LOPHOCLADOS, Mont. Key West.

150. DASYA PLUMOSA, Bail. & Harv. West coast.

Dasya coccinea, Ag., a common European species, is said to have been found on the coast of Maine.

LAURENCIACEÆ.

151. LAURENCIA PINNATIFIDA, Lmx. California.

152. LAURENCIA VIRGATA, Ag. California.

153. LAURENCIA OBTUSA, Lmx. Florida, California.

154. LAURENCIA IMPLICATA, Ag. Key West.

155. LAURENCIA CERVICORNIS, Harv. Key West. Not referred to by Agardh in his Spec. Alg.

156. LAURENCIA GEMMIFERA, Harv. Florida.

157. LAURENCIA PAPILLOSA, Grev. Florida.

*158. LAURENCIA PANICULATA, Ag. Key West, *Dr. E. Palmer.*

159. CHAMPIA PARVULA, Harv. Long Island Sound. Common. — *Northern limit?*

C. salicornoides, Harv., is only a variety of *C. parvula*, found occasionally in Long Island Sound as well as at Key West.

160. Lomentaria ovalis, Endl. California. Have not some of the smaller forms of *Prionitis lanceolata*, Harv., been distributed as *L. Coulteri?*

161. Lomentaria? saccata, J. Ag. California.

CORALLINACEÆ.

As yet we have no good definite characters by which to distinguish the genera and species of this order. The following so-called species include the forms known to exist on our coast.

162. Corallina officinalis, L. Very common from New York northward; California and Oregon.

*163. Corallina squamata, Ellis and Sol. California.

164. Jania rubens, Lmx. Key West.

165. Jania Cubensis, Mont. Key West.

166. Jania capillacea, Harv. Key West.

167. Amphiroa fragilissima, Lmx. Florida.

168. Amphiroa debilis, Kütz. Florida.

169. Arthrocardia frondescens, Aresch. (*Corallina*, Post. and Rupr.) Judging from Ruprecht's figure, this seems to be a common Californian species, and that described in the Nereis Am.-Bor. as *Amphiroa Californica*, Dcne.

*170. Melobesia membranacea, Lmx. East coast.

*171. Melobesia farinosa, Lmx. With the last.

*172. Melobesia pustulata, Lmx. With the last.

*173. Lithothamnion polymorphum, Aresch. Coast of Maine, *Mr. Burgess, Prof. D. C. Eaton.*

SPHÆROCOCCOIDEÆ.

174. Grinnellia Americana, Harv. Long Island Sound.— *Northern and southern limits?*

175. Delesseria sinuosa, Lmx. Long Island Sound northward.

*176. Delesseria quercifolia, Bory. California.

*177. Delesseria angustissima, Griff. Gloucester, Mass.

· 178. Delesseria alata, Lmx. Boston northward.

*179. Delesseria Woodii, Ag., Bidrag. Vancouver's Island.

180. Delesseria hypoglossum, Lmx. Charleston, S.C., and southward.

181. Delesseria tenuifolia, Harv. Key West.

182. DELESSERIA INVOLVENS, Harv. Key West.

183. DELESSERIA LEPRIEURII, Mont. West Point, Jackson's Ferry, N.Y.; and in brackish water southward.

*184. DELESSERIA DECIPIENS, Ag., Bidrag. (*D. hypoglossum*, var. *arborescens*, Harv.) Vancouver's Island.

*185. DELESSERIA INTERMEDIA, Ag., Bidrag. Vancouver's Island.

186. NITOPHYLLUM PUNCTATUM, var. *ocellatum*, Grev. Smithville, N.C.; Key West.

187. NITOPHYLLUM LACERATUM, Grev. California.

*188. NITOPHYLLUM LATISSIMUM, Ag., Bidrag. (*Hymenena*, Harv.) Vancouver's Island.

189. NITOPHYLLUM FRYEANUM, Harv. California.

*190. NITOPHYLLUM (NEUROGLOSSUM) ANDERSONII, Ag. mscr. California.

191. NITOPHYLLUM RUPRECHTIANUM, Ag., Bidrag. (*Hymenena fimbriata*, Post. and Rupr.) West coast. — *Southern limit?*

192? NITOPHYLLUM FISSUM, Ag., Bidrag. (*Hymenena fissa*, Harv.) — The *Botryoglossum platycarpum* of the Nereis Am.-Bor. is, without doubt, the same plant as *Hymenena fimbriata*, Post. and Rupr., which sometimes has an expanse of two feet. I have received specimens from Oregon, where the tetraspores are arranged in a network over the frond, as in *Hymenena fissa.* Harvey says, however, in some specimens of *Botryoglossum*, he has seen on the same individual tetraspores forming a network, and also in marginal leaflets. Applying these remarks to *Hymenena fimbriata*, which was in reality the plant of which Harvey was speaking, we must infer that there is a very strong probability that the American specimens of *Hymenena fissa* are nothing but states of *H. fimbriata*, Post. and Rupr. = NITOPHYLLUM RUPRECHTIANUM, Ag., Bidrag.

193. CALLIBLEPHARIS CILIATA, Kütz. Cape Ann, Mass., and northward. Not common.

194. GRACILARIA MULTIPARTITA, Ag. East and west coasts.

Var. ANGUSTISSIMA. — I can hardly believe that this is really a form of *G. multipartita*, unless it be supposed that *G. compressa*, Grev., is also a variety of the same species. The variety is very common in Long Island Sound, and certainly has more the aspect of *G. compressa* than of *G. multipartita.*

195. GRACILARIA COMPRESSA, Grev. Key West.

196. GRACILARIA CERVICORNIS, Ag. Key West, *Dr. E. Palmer.*

197. GRACILARIA CONFERVOIDES, Grev. Charleston, S.C., southward; California, Oregon.

198. Gracilaria armata, Ag. Key West.

199. Gracilaria divaricata, Harv. Key West.

200. Gracilaria Poitei, Lmx. Key West.

201. Gracilaria damæcornis, Ag. "Atlantic coast of North America."

202. Gracilaria? Blodgettii, Harv. Key West.

Gracilaria Wrightii, Ag., has been found in Cuba, and may be expected at Key West.

GELIDIACEÆ.

203. Gelidium corneum, Lmx. Florida, *Dr. E. Palmer;* California.

Var. crinale. Charleston, S.C.; New Haven, Conn.; Wood's Hole, Mass.; Portland, Me. — M. Bornet has shown that under the name of *G. corneum* are included plants belonging to quite different species, as shown by the arrangement of the placenta.

204. Gelidium cartilagineum, Grev. California.

205. Gelidium Coulteri, Harv. California.

206. Wurdemannia setacea, Harv. Key West.

207. Eucheuma isiforme, Ag. Key West.

208. Hypnea musciformis, Lmx. Wood's Hole, Mass., southward; California.

209. Hypnea? crinalis, Harv. California.

210. Hypnea divaricata, Grev. Key West.

211. Hypnea cornuta, Ag. Key West.

SPONGIOCARPÆ.

212. Polyides rotundus, Grev. New York northward.

SQUAMARIÆ.

213. Peyssonnelia Dubyi, Crouan. Key West. — Is not *P. imbricata*, Kütz., said to have been found at Newfoundland, more probably a *Ralfsia?*

*214. Hildenbrandtia rosea, Kütz. Common on stones all along the New England coast. — I can only distinguish one species on our shores. In the list of algæ published in the Report of the United States Fish Commission for 1871, this species was erroneously supposed to be *H. rubra,* Menegh.

HELMINTHOCLADIÆ.

215. Helminthora divaricata, Ag. Key West.

216. Nemalion multifidum, Ag. Watch Hill, R.I., and northward.

217. Scinaia furcellata, Bivon. Newport, R.I.; Gay Head, Mass., &c.

Var. undulata, Ag. (*Halymenia undulata*, Mont.), of Chili, very much more robust, and quite different in aspect from the type, but still not to be separated by any well-defined character, was found at San Diego, Cal., *Mr. D. Cleveland.*

218. Liagora valida, Harv. Florida.

219. Liagora pinnata, Harv. Florida.

220. Liagora leprosa, Ag. Key West.

221. Liagora pulverulenta, Ag. Key West.

WRANGELIACEÆ.

222. Wrangelia penicillata, Ag. Key West.

*223. Wrangelia multifida, Ag. Key West; Europe. — Although generally placed together in the same genus, these two species have different kinds of fruit.

RHODYMENIACEÆ.

224. Rhodymenia pertusa, Ag. Vancouver's Island.

225. Rhodymenia palmata, Grev. New York northward; North Carolina, fide *Rev. M. A. Curtis.*

226. Rhodymenia Palmetta, Grev. Halifax, N.S. Not yet noticed in New England. California.

227. Rhodymenia corallina, Grev. San Diego, Cal. — Specimens of a *Rhodymenia*, belonging to the subgenus *Palmetta*, have been sent me from San Diego, Cal. The tetraspores are borne on the expanded tips of the frond, and I have little hesitation in naming them *R. corallina*, as they resemble so closely the figure of Bory. Voy. Coq. pl. 16.

228. Euthora cristata, Ag. Nahant, Mass., northward. Common. Dredged in deep water, off Block Island, by the United States Fish Commission.

229. Plocamium coccineum, Lyngb. West coast. Common. Very rare on the east coast.

Var. sinuosum, H. & H., resembling *P. cornutum*, but having the ramuli in sets of 3–5, as in *P. coccineum*, occurs at San Diego, Cal., *Mr. D. Cleveland.*

230. RHABDONIA COULTERI, Harv. West coast.

231. RHABDONIA TENERA, Ag., Bidrag. — According to Agardh, the *Solieria chordalis* of Harvey in Nereis Am.-Bor. is, in reality, *Rh. tenera*, Ag. The plate, No. XXIII. A. fig. 4, of the Ner. Am.-Bor., is incorrect, as there is an opening to the fruit cavity. The structure of this plant deserves farther study.

232. CORDYLECLADIA? HUNTII, Harv. Narragansett Bay.

233. CORDYLECLADIA? IRREGULARIS, Harv. — This is probably the *Chylocladia rigens*, Ag. Spec. Alg. of the West Indies.

CRYPTONEMIACEÆ.

234. STENOGRAMMA INTERRUPTA, Mont. California, Key West. — There has been much discussion about the tetraspores of this plant. They are scattered in sori over the surface, as seen in Californian specimens, and were described by Montagne, in Ann. Nat. Hist., ser. 2, vol. 7; and Harvey, in the Ner. Am.-Bor., speaks of receiving them from Miss Gifford, a fact of which *Mr. E. W. Holmes* does not seem to be aware (vid. *Grevillea*, Dec. 1874).

235. PHYLLOPHORA BRODIÆI, Ag. L. I. Sound northward.

236. PHYLLOPHORA MEMBRANIFOLIA, Ag. Same limits.

*237. PHYLLOPHORA CLEVELANDII, n. sp. Caulescens stipite cylindraceo ramoso flexuoso, ramis in laminas planas ovato-lanceolatas, simplices vel cuneatas cum proliferationibus terminalibus expansis. Frondes a basi unilateraliter incisæ in partem angustam quae continuatio stipitis videtur. San Diego, Cal., *Mr. D. Cleveland.* — Distinguished by the large size of the more commonly simple fronds, which are from two to four inches long by one broad, and the narrow proliferation from the base of the laminæ, which seems like a continuation of the stipe.

238. GYMNOGONGRUS TORREYI, Ag. A narrow variety of *G. Norvegicus*. New York.

239. GYMNOGONGRUS TENUIS, Ag. California. Also found in the West Indies, and therefore to be expected at Key West.

*240. GYMNOGONGRUS GRIFFITHSIÆ, Ag. California, fide *Prof. D. C. Eaton.* Common in Europe, but not seen on our east coast.

241. GYMNOGONGRUS NORVEGICUS, Ag. Penobscot Bay, Me., *Mr. J. Hooper;* Nahant, Mass., washed ashore; Peak's Island, Portland harbor, Me., in deep pools, Sept. 1874, *W. G. F.* I have seen

no Californian specimens which, it seemed to me, belonged certainly to this species.

242. AHNFELTIA PLICATA, Fr. New York northward; west coast. — *Southern limit?*

243. AHNFELTIA GIGARTINOIDES, Ag. West coast.

244. AHNFELTIA? PINNULATA, Harv. Key West.

245. CYSTOCLONIUM PURPURASCENS, Kütz. New York northward. — *Southern limit?*

246. CALLOPHYLLIS LACINIATA, Kütz. Cape Henlopen; California, fide *Harvey*.

*247. CALLOPHYLLIS VARIEGATA, Ag. California; west coast of South America; Australia.

*248. CALLOPHYLLIS OBTUSIFOLIA, Ag. (non Harvey, Phy. Austr. vol. 4, pl. 193). — With regard to the Californian species of *Callophyllis* there has been great confusion. This has arisen, in part, from the fact that the only species mentioned in the Nereis Am.-Bor. as found on that coast is *C. laciniata*, which, I am convinced, is rare, if it occurs at all there. I had myself named specimens *C. laciniata*, but, never having received the fruit characteristic of this species from California, my determination was based altogether on the shape of the frond, which, in the specimens I have seen, is never so flabellately expanded as in European specimens of *C. laciniata*, of which I have a large suite. My specimens were all *C. variegata*, which seems to be quite common in California. In this species, the frond is decompound pinnate, the terminal pinnules erect and crenulate. The conceptacles are not in marginal leaflets, as in *C. laciniata*, but in the frond close to, or on, the margin, and of large size. The color is very variable, from rosy red to almost black. The tips are often greenish, as figured in Bory. Coq. pl. 14.

I venture to give the name of *C. obtusifolia*, Ag., to specimens sent me by *Mr. D. Cleveland*, from San Diego, Cal. My reasons for so doing will be more properly stated in another paper. In brief, this species may be known by its narrow, repeatedly dichotomous frond, and conceptacles scattered over the surface prominent on both sides.

Besides the above-mentioned species, I have a specimen, presented by my friend *Prof. D. C. Eaton*, in which the conceptacles are scattered through the frond, which is palmately divided, and of a purplish lake color. This, although agreeing tolerably well with the description, does not resemble very closely the plate of *Callophyllis* (*Rhodymenia*) *ornata*, Mont., of which I have no authentic specimen for comparison. Should this prove new, it ought properly to bear the name of Prof. Eaton.

Callophyllis discigera, Ag., of the Cape of Good Hope, is to be expected in California.

249. CONSTANTINEA SITCHENSIS, Post. and Rupr.

*250. KALLYMENIA PHYLLOPHORA, Ag., Bidrag. Vancouver's Island.

*251. GIGARTINA ACICULARIS, Lmx. Florida, *Dr. E. Palmer.*

252. GIGARTINA CANALICULATA, Harv. West coast.

253. GIGARTINA MOLLIS, Bail. and Harv. Puget Sound.

254. GIGARTINA MAMILLOSA, Ag. Boston northward; Oregon.

255. GIGARTINA MICROPHYLLA, Harv. California. β. var. *horrida.* — A very variable species. Harvey seems to have had only large and tetrasporic specimens. The more common form is what I have called var. *horrida*, which may perhaps prove to be a good species. Here, the frond is not more than half an inch wide, at times almost cylindrical, forking at the tip, and usually with a few pinnæ towards the base. Both the main frond and pinnæ are intricately covered with spines, which are sometimes half an inch long and nearly cylindrical. In these are immersed the conceptacles and the sori of tetraspores, the latter of which are either circular or linear. In those cases where the pinnæ are not so densely covered with spines as usual, the sori are thickly scattered over the surface of the pinnæ themselves.

*256. GIGARTINA JARDINI, Ag., Bidrag. California.

*257. GIGARTINA PISTILLATA, Lmx. San Diego, Cal., *Hassler Exp.;* Europe; Chili.

*258. GIGARTINA VOLANS, Ag. West coast? Vid. Ag., Icon. Ined., table xviii.

259. GIGARTINA SPINOSA, Kütz. California.

260. GIGARTINA EXASPERATA, Bail. and Harvey. Puget Sound. — Seems to me a variety of the next.

261. GIGARTINA RADULA, Ag. West coast. — *Northern limit?*

*262. GIGARTINA CHAMISSOI, Mont.? California, *Harvey.*

263. IRIDÆA MINOR, Ag. California.

264. IRIDÆA DICHOTOMA, Harv. California.

265. IRIDÆA LAMINARIOIDES, Bory. Oregon, *Mr. E. Hall.*

266. IRIDÆA PUNICEA, Post. and Rupr.? Santa Cruz, Cal.

*267. SCHIZYMENIA EDULIS, Ag. Oregon, *Mr. E. Hall.* — Another case of a common European alga, found in Japan and California, but not on the east coast of North America.

268. CHONDRUS CRISPUS, Lyngb. North Carolina, fide *Rev. M. A. Curtis;* and northward. — *Southern limit?*

269. CHONDRUS AFFINIS, Harv. California. — About this plant

there is, and probably always will be, some doubt, as Harvey's specimens were very poor, and, at the best, species of *Chondrus* are very variable. Furthermore, when we consider that sterile specimens of *Gigartina*, *Chondrus*, and *Iridæa*, cannot be generically distinguished from one another by any definite character, and when we remember that species have been described in all these genera from sterile specimens, the prospect is almost hopeless. The variability of *Chondrus crispus* of our eastern coast is well known, and there is no reason why any other *Chondrus* should not vary to the same extent. The question for the California botanists to answer is, Is there more than one species of *Chondrus* on the west coast? If there is but one, it will probably be found that *C. affinis*, Harv., is nothing but a form of *C. canaliculatus*, Ag., which is common on the west coast of South America, and very variable.

270. ENDOCLADIA MURICATA, Ag. San Diego, Cal., northward.

271. GLOIOPELTIS FURCATA, Ag. Oregon, *Mr. E. Hall.*

272. CRYPTONEMIA CRENULATA, Ag. Key West.

*273. CRYPTONEMIA LUXURIANS, Ag. Key West, *Dr. E. Palmer;* West Indies, Brazil, Ceylon.

274. CHYLOCLADIA ? BAILEYANA, Harv. Long Island Sound and southward. Said by Zanardini in Phyc. Alg. Adriat, vol. ii. pl. 43, to be the same as *C. uncinata*, Menegh. I have found our plant in fruit, however, and it is not a *Chylocladia* in the proper sense.

275. CHYLOCLADIA ROSEA, Harv. Newport, R.I., *Mr. S. T. Olney;* dredged in ten fathoms off Gay Head, *W. G. F.;* Portsmouth, N.H., *Dr. Durkee.*

276. CHRYSYMENIA ENTEROMORPHA, Harv. Key West.

277. CHRYSYMENIA HALYMENIOIDES, Harv. Key West.

278. CHRYSYMENIA AGARDHII, Harv. Key West.

279. CHRYSYMENIA RAMOSISSIMA, Harv. (*Rhabdonia ramosissima*, Ag., Bidrag, p. 38.) Key West.

280. CHRYSYMENIA ? ACANTHOCLADA, Harv. Key West.

281. CHRYSYMENIA UVARIA, Ag. Key West.

282. HALYMENIA LIGULATA, Ag. Key West.

283. HALYMENIA FLORESIA, Ag. Key West.

284. HALOSACCION HYDROPHORA, Ag. Oregon, *Mr. E. Hall.*

285. HALOSACCION FUCICOLA, Post. and Rupr. California.

286. HALOSACCION RAMENTACEUM, Ag. Rye Beach, N.H., northward. — *Southern limit?*

287. FURCELLARIA FASTIGIATA, Lyngh. Said to have been found on the New England coast.

288. Corynomorpha clavata, Ag., Bidray. (*Acrotylus clavatus*, Harv.) Key West.

289. Prionitis lanceolata, Harv. West coast.

*290. Prionitis Andersonii, Eaton. Santa Cruz, San Diego, Cal. — I have specimens from Oregon collected by *Mr. E. Hall*, which resemble the plate of *Fucus crinitus* (Turn. pl. 123). To this plate Ruprecht refers in describing his *Tichocarpus crinitis*, a species recognized by Agardh in his Bidrag till Florideernes Systematik, page 15, and supposed by him to be related to *Pikea* and to be placed in the *Dumontiæ*. *Tichocarpus* bears a strong external resemblance to *Prionitis*, and it is to be hoped that collectors on the west coast will find fruiting specimens of the plant collected by Mr. Hall, that its true position may be determined.

291. Grateloupia Gibbesii, Harv. Charleston, S.C., and southward. — *Grateloupia Cutleriæ* of Chili, which resembles this, is to be expected in California.

292. Grateloupia versicolor, Ag. California?

293. Grateloupia filicina, Ag. Florida.

294. Catanella pinnata, Harv. Key West.

*295. Nemastoma? Bairdii, n. sp. Frons vermiformis, gelatinosa, dichotoma; axillæ acutæ, segmenta terminalia attenuata. Sporas non vidi. Tetrasporæ cruciatæ solitariæ ad geniculas ramellorum corticalorum. — Gay Head, Mass.

Of this rare plant there is but one specimen known. This was found by me washed ashore at Gay Head, and supposed, at the time, to be a *Nemalion*. The genus *Nemalion*, however, has tripartite tetraspores, and our plant more properly belongs to *Nemastoma*, the nearest allied species of which is *N. vermicularis*. From this it differs by being dichotomous.

296. Gloiosiphonia capillaris, Carm. Occasionally from Long Island Sound to Cape Ann, Mass.

SPYRIDIACEÆ.

297 Spyridia aculeata, Kütz. Florida.

298. Spyridia filamentosa, Harv. Massachusetts Bay southward.

CERAMIACEÆ.

299. Microcladia Coulteri, Harv. West coast, common.

*300. Microcladia Californica, n. sp. Frons compressa, decomposita pinnata. Pinnulæ ultimæ dichotomo-corymbosæ. Favellæ ad ramellos externe insertæ, nudæ. Forma et substantia *P. Coulteri* similis, ramificatione ultimarum pinnularum et insertione favellarum differt. — California, Oregon.

It has long seemed to me that the specimens of *Microcladia Coulteri* distributed by collectors differed very much in aspect, and that at least two different varieties could be distinguished. *M. Californica*, in fruit, is easily distinguished from the typical specimens and figure of *M. Coulteri* by the favellæ which are borne on the outer side of the ultimate ramuli, and are always destitute of the involucre which is found in *M. Coulteri*. *M. Californica* resembles in habit *Polysiphonia Woodii*, which *M. Coulteri* does not.

301. MICROCLADIA BOREALIS, Rupr. California, Oregon.

302. CENTROCERAS CLAVULATUM, Ag. Key West, California.

*303. CENTROCERAS EATONIANUM, n. sp. Frons capillaris, inermis, pinnata. Pinnæ distichæ, bi-tripinnatæ, segmenta terminalia divaricata. Geniculæ constrictæ. — Oregon, *Mr. E. Hall;* California.

This species bears more resemblance to a *Ceramium* than to *C. clavulatum*, from which it differs in being pinnate instead of dichotomous and constricted at the joints, which are smooth and destitute of spines.

304. CERAMIUM NITENS, Ag. Key West.

305. CERAMIUM RUBRUM, Ag. Everywhere on the east coast, but not yet known, with certainty, on the west.

306. CERAMIUM DESLONGCHAMPSII, Ch. Common on rocks. Nahant, Mass., northward.

The species called by Harvey *Ceramium Hooperi* was founded on poor specimens of *C. Deslongchampsii*, a common European species. Harvey mentions the "dark purple endochrome" as peculiar to *C. Hooperi*. It is, however, found in *C. Deslongchampsii*. The "root-like filaments" are found in all the procumbent *Ceramia* and *Polysiphoniæ*. Harvey says that the plant is one or two inches high. I have collected it in Portland harbor nearly five inches high.

307. CERAMIUM DIAPHANUM, Roth. Certainly not common on the east coast, although I have found what I think must be this species at Nahant, Mass. — Key West and California specimens look more like the typical European specimens than do the New England specimens.

*308. CERAMIUM STRICTUM, Harv. New Haven, Noank, Conn.; Wood's Hole, Mass. — Nine-tenths of the American specimens of *C. diaphanum* belong to this species, which is much more slender and somewhat corymbose.

309. CERAMIUM TENUISSIMUM, Lyngb. Key West, *Harvey*.

310. CERAMIUM FASTIGIATUM, Harv. Long Island Sound, Massa-

chusetts Bay. — The *Ceramium arachnoideum?* Ag. of the Nereis Am.-Bor. is not the true species of Agardh, to whom I showed American specimens. The species so designated by Harvey is not uncommon on the New England coast; but what it really is, whether peculiar to America or a European species also, must remain in doubt.

311. CERAMIUM BYSSOIDEUM, Harv. Key West.

312. PTILOTA DENSA, Ag. California.

313. PTILOTA HYPNOIDES, Harv. (inc. *P. Californica*, Rupr. partim). — This species was first described in 1841 by Harvey in the botany of Beechey's Voyage. In the Nereis Am.-Bor., Harvey also describes a *Ptilota Californica*, Rupr., with a variety *concinna*. Through the kindness of Prof. Wright, of Dublin, I was enabled to examine the specimens of the last-named species and variety in the Harvey Herbarium.

Strange to say, the *P. Californica* of Harvey's Herbarium corresponds precisely to the description and plate of *P. hypnoides*, while the variety *concinna* is quite different and more closely related to *P. plumosa.* Furthermore, the var. *concinna* is not the *P. concinna* of the Rodgers and Ringgold Expedition. There can be little doubt that *P. hypnoides* and *P. Californica*, exclusive of var. *concinna*, should be united. The question is, Which name has the priority? There is no reference to *P. Californica* either in Postels and Ruprecht's Illustrationes or in the Phycologia Ochotensis, and I cannot ascertain when or where it was ever published by Ruprecht. On the supposition that it was first described by Harvey in the Nereis Am.-Bor., the name *P. Californica* should give place to *P. hypnoides* of Beechey's Voyage.

The position of the var. *concinna* is difficult to define. I saw in the Ruprecht Herbarium at St. Petersburg specimens labelled *P. filicina*, which were evidently the same as the var. *concinna.* If I am not mistaken, *P filicina* was never published by Ruprecht. After a careful comparison of Californian specimens with authentic specimens of *P. plumosa* presented by Prof. Agardh, I venture to express the opinion that *P. Californica*, var. *concinna*, of the Nereis Am.-Bor., is a variety of *P. plumosa;* and, not to confuse it with the specimens of Rodgers and Ringgold's Expedition, distributed under the name of *P. concinna*, I would propose the name *P. plumosa*, var. *filicina.* This variety differs from the type in being more regularly pinnate and of a thicker substance. Fragments of the base look like a distinct species; but examination of the tips and younger undenuded parts of the frond show that they are not specifically distinct from *P. plumosa.* The specimens distributed with Hall's Oregon Algæ as *P. pectinata*, Harv., belong to the variety under consideration. I had named them *P. pectinata*, Harv. (*P. densa*, Ag.), after comparing them with a specimen from Lenormand, which I have since found out is incorrectly named.

The species of *Ptilota* of our west coast may be briefly enumerated as follows: —

P. densa, Ag., in which the pinnæ are *falcate* and incised on the *outer* side only, as is well shown in Pl. XXXII. B. fig. 2, of Nereis Am.-Bor. This species seems more common southward.

P. hypnoides, Harv. More delicate than the last, with pinnæ, which are *lanceolate*, with a smooth, slightly crenulated, or dentate margin, and *contracted at the base*. Pl. XXXII. A. B. C.

P. aspenioides, Ag., differing from the last by being coarser and having the usually somewhat serrated pinnæ *decurrent at the base*. This occurs in Oregon, and is a common species of Alaska.

P. plumosa, Ag. More common northward, and var. *filicina* found also in California. In this species the pinnæ are regularly *pectinate on both sides.*

314. PTILOTA ASPLENIOIDES, Ag. Oregon northward.

315. PTILOTA PLUMOSA, Ag., and var. FILICINA. California northward; east coast, very rare?

316. PTILOTA SERRATA, Kütz. Nahant, Mass., northward, common; Sitcha.

317. PTILOTA ELEGANS, Bonnem. New York northward. Not so common north of Cape Cod as in Long Island Sound.

318. CROUANIA ATTENUATA, J. Ag. Key West.

319. HALURUS EQUISETIFOLIUS, Kütz.

320. GRIFFITHSIA CORALLINA? Ag. and var. *tenuis*. — Under this, in the Nereis Am.-Bor., are included two different species, neither of which is certainly *C. corallina.* The variety *tenuis* was afterwards considered by Harvey a *Callithamnion.* This variety occurs as far north as Gloucester, Mass. In the absence of fruit, it is impossible to say whether it is a *Callithamnion* or not.

321. CALLITHAMNION PIKEANUM, Harv. California.

322. CALLITHAMNION TETRAGONUM, Ag. New York northward.

323. CALLITHAMNION BAILEYI, Harv. New York northward.

324. CALLITHAMNION SQUARRULOSUM, Harv. California. — The specimens distributed under this name in Hall's Oregon Algæ now seem to me doubtful.

325. CALLITHAMNION BORRERI, Ag. New York to New Bedford.

326. CALLITHAMNION POLYSPERMUM, Ag. New York southward.

327. CALLITHAMNION BYSSOIDEUM, Arn. New York to Nahant, Mass.

328. Callithamnion Dietziæ, Hooper. — Among the algæ collected by me at Wood's Hole were several *Callithamnia*, which I was unable to determine. Some of the specimens which I thought might be *C. Dietziæ* proved to be varieties of *C. byssoideum.* Three specimens, on comparison with the type in the Herbarium of Trinity College, Dublin, prove to be *C. Dietziæ*, which is apparently rare.

329. Callithamnion corymbosum, Ag. New York northward.

330. Callithamnion versicolor, Ag., var. seirospermum, Harv. New York northward. — This is not the only species in which the so-called seirospores are found, as they are also recorded by Zanardini in *C. graniferum*, Menegh.

331. Callithamnion plumula, Lyngb. Long Branch, N.J.; Newport, R.I.; Gay Head, Mass., &c. — The var. *crispum*, which is common in some parts of Europe, does not occur in America.

332. Callithamnion Americanum, Harv. New York northward.

333. Callithamnion Pylaisæi, Mont. (*Wrangelia*, Ag.) Nahant northward. — *Fruit?*

334. Callithamnion floccosum, Ag. Boston, Cape Ann, Mass.; Portland, Me.

335. Callithamnion cruciatum, Ag. New York and various places in Long Island Sound.

336. Callithamnion Turneri, Ag. (*Spermothamnion*, Aresch.) In several places on Long Island Sound; Nantucket, very abundant, *W. G. F.*

337. Callithamnion Rothii, Lyngb. (*Thamnidium*, Thuret.) In several places on the New England coast, growing on rocks. — The remaining species of *Callithamnion* of the Nereis Am.-Bor. are properly *Chantransiæ* and should be removed from *Ceramiaceæ.*

*338. Chantransia secundata, Thur. on *Chætomorpha tortuosa.* Peak's Island, Me.

339. Chantransia virgatula, Thur. New York; Cape Ann, Mass.

340. Chantransia Daviesii, Thur. Gloucester, Mass., *Mrs. J. T. Lusk.*

INCERTÆ SEDIS.

341. Pikea Californica, Harv. California.

*342. Pikea Woodii, Ag., Bidrag. Vancouver's Island.

*343. Pikea Grayana, Ag, Bidrag. Vancouver's Island. — The genus *Pikea* was founded by Harvey, who described *P. Californica* from sterile specimens which had been sent to him. In his Bidrag till Florideernes Systematik, published in 1870, Agardh, who at that time had never seen a specimen of *P. Californica*, added two more species and first described the fruit, from which he decided that the genus belonged to the *Dumontiæ*. I have no specimens of *P. Woodii* or *P. Grayana*. Of *P. Californica* I have only seen fruiting specimens through the kindness of Prof. Eaton. As the plant should be examined in a living condition, I will not increase our ignorance by saying any thing on the subject. It is evidently destined to wander through different orders before reaching its final resting-place.

CHLOROSPERMÆ.

SIPHONACEÆ.

344. Caulerpa prolifera, Lmx. Florida.

345. Caulerpa crassifolia, Ag., var. Mexicana. (*C. Mexicana*, Sond.) Florida.

346. Caulerpa plumaris, Ag. Florida.

347. Caulerpa Ashmeadii, Harv. Key West.

348. Caulerpa ericifolia, Ag. Florida.

349. Caulerpa cupressoides, Ag. Key West.

350. Caulerpa lanuginosa, Ag. (*C. Lycopodium*, Harv.) Key West.

351. Caulerpa Paspaloides, Bory. Florida.

352. Caulerpa clavifera, Ag. Florida. — The fructification of this interesting genus has not yet been observed. As Key West offers better material than the shores of Europe, it is to be hoped that some of our countrymen will turn their attention to this point.

353. Halimeda Opuntia, Lmx. Florida.

354. Halimeda incrassata, Lmx. Florida.

355. Halimeda tridens, Lmx. Key West.

356. Halimeda tuna, Lmx. Florida.

357. Udotea flabellata, Lmx. Key West.

358. Udotea conglutinata, Lmx. Key West.

359. Codium tomentosum, Stack. Florida; west coast.

360. Chlorodesmis? Vaucheriæformis, Harv. Key West.

361. Bryopsis plumosa, Lmx. Whole eastern coast.

362. Bryopsis hypnoides, Lmx. Key West.

DASYCLADEÆ.

363. Dasycladus occidentalis, Harv. Florida.

*364. Dasycladus clavæformis, Ag. Key West, West Indies; Mediterranean.

365. ACETABULARIA CRENULATA, Lmx. Florida. — For the history of the development of this genus we are indebted to Woronin, whose researches, however, were brought to an end before he had seen the dispersion and germination of the spores. *Dr. E. Palmer*, while at Key West last summer, collected specimens of this plant in fruit, and in some of them the radiating cells at the summit had separated, giving the appearance seen in the genus *Polyphysa*. It might be asked whether *P. Cliftoni*, Harv., which is figured in fruit in the Phycologia Australica and described as rare, is any thing more than the fruiting state of some *Acetabularia*.

VALONIACEÆ.

366. CHAMÆDORIS ANNULATA, Mont. Key West.

367. PENICILLUS DUMETOSUS, Dne. Florida.

368. PENICILLUS CAPITATUS, Lmk. Key West.

369. PENICILLUS PHŒNIX, Lmk. Florida.

370. BLODGETTIA CONFERVOIDES, Harv. — This plant is certainly worthy a most careful study. The figure of Harvey is most extraordinary; and, if correct, this plant deserves, at least, to be the type of a new order. As M. Bornet suggests, however, the spores? are parasitic unicellular algæ. The *Blodgettia* itself is probably nothing more than a *Cladophora* nearly related to *C. prolifera.*

371. ANADYOMENE FLABELLATA, Lmx. Key West.

372. DICTYOSPHÆRIA FAVULOSA, Dne. Key West.

*373. ASCOTHAMNION INTRICATUM, Kütz. Key West, *Dr. E. Palmer.*

ULVACEÆ.

374. PORPHYRA VULGARIS, Ag. East and west coasts.

375. BANGIA FUSCOPURPUREA, Lyngb. East coast.

376. BANGIA VERMICULARIS, Harv. West coast.

377. ERYTHROTRICHIA CILIARIS, Thuret. (*Bangia,* Harv. Ner.) Charleston, S.C.

*378. ERYTHROTRICHIA CERAMICOLA, Aresch. (*Bangia,* Harv. Phyc. Brit. pl. 317.) Cape Ann, Mass.; Portland harbor, Me., *W. G. F.*

*379. GONIOTRICHUM ELEGANS, Zanard. On Dasya. Gloucester, Mass. Coll. by *Mrs. J. T. Lusk.*

380. ENTEROMORPHA INTESTINALIS, Link. Everywhere.

381. ENTEROMORPHA COMPRESSA, Grev. Everywhere. — Both of the last are included by Le Jolis in *Ulva enteromorpha.*

332. ENTEROMORPHA CLATHRATA, Grev. (inc. *E. Hopkirkii*, &c.) Common, east coast. — This and a part of *E. compressa* are included by Le Jolis in *Ulva clathrata*.

383. ULVA FASCIATA, Delile. California.

384. ULVA LINZA, Linn. A variety of the next.

385. ULVA LATISSIMA, Linn. Everywhere.

386. ULVA LACTUCA, Linn. With the last, but not so common.

387. CLADOPHORA REPENS, Ag. Key West.

388. CLADOPHORA MEMBRANACEA, Ag. Key West.

389. CLADOPHORA RUPESTRIS, L. New York northward.

390. CLADOPHORA CARTILAGINEA, Rupr. West coast.

391. CLADOPHORA ARCTA, Dillw. New York northward.

392. CLADOPHORA LANOSA, Roth. Boston?

393. CLADOPHORA UNCIALIS, Fl. Dan. At different points on the New England coast.

394. CLADOPHORA GLAUCESCENS, Griff. Charleston, S.C., northward.

395. CLADOPHORA FLEXUOSA, Griff. New York, Massachusetts Bay.

396. CLADOPHORA MORRISIÆ, Harv. Elsinborough, Del., *Miss Morris*.

397. CLADOPHORA REFRACTA, Roth. Charleston, S.C., northward.

398. CLADOPHORA ALBIDA, Huds. New York and New Jersey.

399. CLADOPHORA RUDOLPHIANA, Ag. Jackson's Ferry, N.Y.

400. CLADOPHORA GRACILIS, Griff. Beesley's Point, N.J.; Rhode Island; Nahant, Mass.

401. CLADOPHORA BRACHYCLADOS, Mont. Texas.

402. CLADOPHORA LUTEOLA, Harv. Key West.

403. CLADOPHORA LÆTEVIRENS, Dillw. New York; Boston; California.

404. CLADOPHORA DIFFUSA, (?) Harv. New York.

405. CLADOPHORA FRACTA, Fl. Dan. New York and New Jersey.

406. CHÆTOMORPHA PIQUOTIANA, Mont. New York northward.

407. CHÆTOMORPHA MELAGONIUM, Weh. and Mohr. Boston northward.

408. CHÆTOMORPHA AEREA, Dillw. Newport, R.I.; New York.

409. CHÆTOMORPHA OLNEYI, Harv. Rhode Island.

410. CHÆTOMORPHA LONGIARTICULATA, Harv. Massachusetts and Rhode Island, *fide Harvey*.

411. CHÆTOMORPHA SUTORIA, Berk. Stonington, Conn.

412. CHÆTOMORPHA BRACHYGONA, Harv. Key West.

413. CHÆTOMORPHA TORTUOSA, Dillw. Nahant, Mass., northward. Common.

414. HORMOTRICHUM YOUNGANUM, Dillw. New York.

415. HORMOTRICHUM CARMICHÆLII, Harv. Boston, *Mr. Calverly.*

416. LYNGBYA MAJUSCULA, Harv. Wood's Hole, Mass., and southward.

417. LYNGBYA FERRUGINEA, Ag. New York; Greenport, L.I.

418. LYNGBYA FULVA, Harv. Stonington, Conn.

419. LYNGBYA NIGRESCENS, Harv. Peconic Bay, L.I.

420. LYNGBYA CONFERVOIDES, Ag. Charleston, S.C.

421. LYNGBYA PUSILLA, Harv. Sullivan's Island, S.C.

422. LYNGBYA HYALINA, Harv. Key West.

423. CALOTHRIX CONFERVICOLA, Ag. Everywhere.

424. CALOTHRIX SCOPULORUM, Ag. Everywhere.

425. CALOTHRIX VIVIPARA, Harv. Seaconnet Point, R.I.

426. CALOTHRIX PILOSA, Harv. Key West.

427. CALOTHRIX DURA, Harv. Key West.

428. MICROCOLEUS CORYMBOSUS, Harv. Key West.

*429. SPHÆROZYGA CARMICHÆLII, Harv. Noank, Conn.; Europe.

*430. RIVULARIA ATRA, Roth. New England. Common on rocks and shells. Europe.